

**Determinants and Outcome of Information Technology Governance (ITG)
Effectiveness to Organizational Performance: An Empirical Study of Public Listed
Companies (PLC) in Malaysia**

**BY
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LIST OF ABBREVIATIONS

Abbreviation	Description
AVE	Average Variance Extracted
BNM	Bank Negara Malaysia
DOI	Diffusion On Innovation
ERM	Enterprise Resource Management
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IS	Information System
ITG	Information Technology Governance
ITGI	IT Governance Institute
MIDA	Malaysian Investment Development Authority
RBV	Resource Based View
PLC	Public Listed Company
PLS	Partial Least Square
SEM	Structural Equation Modeling
TOE	Technology-Organization-Environment

ABSTRAK

Malaysia telah menyedari kepentingan ITG dalam organisasi yang juga didorong oleh pelaksanaan tadbir urus korporat. Sebagai pendahuluan teknologi maklumat dari semasa ke semasa, kemampuan organisasi untuk menggabungkan sumber-sumber teknologi maklumat untuk bertindak balas terhadap persekitaran perniagaan yang kompleks untuk meningkatkan prestasi organisasi. ITG efektif telah menjadi sangat penting dan penting bagi syarikat korporat untuk menjalankan perniagaan mereka. Kebanyakan kajian lepas yang berkaitan dengan ITG memberi tumpuan kepada aspek teknologi dan operasi teknologi semata-mata. Terdapat kajian yang terhad yang menekankan faktor-faktor lain dalam pandangan menyeluruh dan stres pada kesan bahawa keberkesanan ITG boleh membawa dari segi prestasi kewangan dan bukan kewangan yang kukuh. Oleh itu, kajian ini bertujuan untuk mengenal pasti peramal dan hasil dari keberkesanan ITG bagi Syarikat Awam Tersenarai di Malaysia dengan menggunakan teknologi, Organisasi, dan rangka kerja Alam Sekitar (TOE) dan bagaimana keberkesanan ITG itu akan memberi kesan kepada prestasi syarikat. Oleh itu, data dikumpulkan melalui soal selidik daripada Syarikat Awam Tersenarai di Malaysia. Selepas itu, Partial Least Square (PLS) Structured Equation Modeling (SEM) digunakan untuk memeriksa dan menganalisis data yang dikumpulkan berdasarkan hipotesis berasal dari kerangka penyelidikan. Keputusan akhir menunjukkan bahawa keupayaan teknologi, sokongan pengurusan atasan dan turun naik alam sekitar adalah peramal penting yang mempengaruhi keberkesanan ITG bagi Syarikat Awam Tersenarai di Malaysia. Sementara dari analisis data yang dikumpul juga, keberkesanan ITG mempunyai kesan yang ketara kepada prestasi organisasi.

ABSTRACT

Malaysia has realised the importance of Information Technology Governance (ITG) in organizations which is also strongly driven by the implementation of corporate governance. As information technology advances from time to time, the ability of organizations to combine information technology resources to respond to the complexity business environment in order to improve organizational performance have also increased. Effective ITG has become very crucial and vital for corporate companies in conducting their business. Most past researches pertaining to ITG focused on the technological and operational respects of the technology. There are limited studies that emphasize other factors in a holistic view and stress on the outcome that ITG effectiveness can bring in terms of financial and non-financial aspects of firm performance. Therefore, this study is aimed to identify the determinants and outcome of ITG effectiveness for Public Listed Companies (PLCs) in Malaysia and the outcome of ITG effectiveness to company performance. As such, data were collected via questionnaires from Public Listed Companies (PLCs) in Malaysia. Subsequently, Partial Least Square (PLS) of Structured Equation Modeling (SEM) was used to examine and analyze the data based on the hypotheses derived from the research framework. Findings from this research help the PLCs to integrate the research framework in their current business organization and to support the improvement of ITG effectiveness. The final results indicate that technology capability, top management support and environmental volatility are significant determinants affecting ITG effectiveness for Public Listed Companies (PLCs) in Malaysia. Meanwhile, the effectiveness of ITG has significant impact to organizational performance.

CHAPTER 1

1.0 Introduction

Information technology (IT) has become very important in the fast-paced information economy and the needs of good fundamental to maintain, continue, and develop a business. As a result, big corporations are willing to invest lot money in IT. Gartner (2014) reports that despite the current economic slowdown, worldwide IT spending reached \$3.8 trillion in 2014 (projected amount), a 3.1 percent increase from 2012.

IT, for so long having been considered as an enabler of an organization's strategy, is now viewed as an integral part of an organization's strategy in facilitating the exploitation of information-based competitive advantage to maximize benefits, capitalize on opportunities, and promote organizational growth (Raghunathan & Raghunathan, 1990). Kraemer, K. L., & King, J. L. (2003) has also stressed on Information Communication Technology improves the process between the department and their stakeholder such as employees, customers and business partners where the process has became more efficient, effective, transparent, accountable and responsible. Lunardi, G. L., Maçada, A. C. G., & Becker, J. L. (2014) stated that Information Technology Governance (ITG) has become an important concern for business in United States as they have been focused on increasing and ensuring good returns on IT investment and the enacted the Sarbanes-Oxley Act (2002). Many organizations are implementing IT governance practices into day-to-day operations to strategically drive and control IT, particularly to ensure that IT investments are directed and implemented in a manner that achieves business value.

Certainly, adopting a sound ITG mechanism is understood to be means for creating a good IT function (Brown, C. V., 1997). Organizations aim for ITG mechanisms as a key of rationalizing, directing and coordinating an organization's IT-related decision making (Huang, R., Zmud, R. W., & Price, R. L., 2010) expecting to be profitable from IT investments, benefiting the organization and impacting its performance.

The implementation of ITG mechanisms integrate both the understanding and appliance of ITG in a practical business situation especially the alignment of IT with business, IT enablement of business processes, maximization of IT benefits, responsible use of IT resources, and appropriate management of IT risk (Wilkin, C. L., & Chenhall, R. H., 2010).

This study investigates the determinant and outcome on ITG effectiveness using the combining theory of Technology-Organization-Environment (TOE) model and Resource Based View (RBV), and how the ITG effectiveness impact on organizational performance. In this chapter, it starts with research background and the research problem statement. Subsequently this chapter is going to outline the research objectives, research questions, description of key terms of major variables and the significance of the study.

Although some researchers have stated that effective IT governance is crucial for any organization to achieve its corporate goals, little academic research is available that empirically supports the assumptions about factors that determine the effectiveness of IT governance. With this study, we hope to fill this important gap.

1.1 Background of study

Bursa Malaysia is regulator in Malaysia Stock Exchange where Bursa Malaysia has important role to maintain a fair and orderly trading market in Malaysia. In Bursa Malaysia, it provides good framework and regulatory to ensure protection on investors, great transparency, high standard of conduct & governance, integrity. Public Listed Companies (PLCs) in Malaysia comprises of Main Board and ACE Market with total of 930 companies as at 30 September 2014 (Bursa Malaysia Listing Companies, 2014). Bursa Malaysia has improved their net profit at 15% to RM173.08 million for Dec 2013 which is the highest since year 2008 and trading volume in stock exchange has boosted the earnings (The Star, 2014).

According to Bank Negara Malaysia (BNM), GDP growth was recorded at 5.2% in 2011, 5.6% in 2012 and 4.7% in 2013. In year 2013, total value of stock market capitalisation of PLC in Malaysia was at RM 1,702 billion where year 2012 was valued at RM 1,466 billion and 2011 was valued at RM 1,285 billion. FBM KLCI was recorded at 1,530.73 in year 2011, 1,688.95 in year 2012 and 1,866.96 in year 2013. In recent years, we able to observe positive improvement in our GDP, KLCI index and also total valued of stock market capitalisation of PLC (Bursa Malaysia, 2013).

Malaysia has experienced financial crisis in year 1997 and has caused our stock rating downgraded to junk, the KLSE has dropped 50% to 600 points. Due to the failure, Malaysia has learnt a great lesson from the crisis and has widely introduced corporate governance, enhanced financial system transparency which are highlighted by Noordin, (1999). Although corporate governance has started to gain more attention but ITG was

only minimal practiced after the crisis (Lin, Arshad, Haron, Yap, Yusoff, & Mohamed, 2010). In this 21st century, companies are strongly influenced by technology advances and heavily rely on internet. The growth of information technology is becoming important role for operating the business in this fast-growing business environment. Information system is unique and valuable resources that can be improved performance (Ravichandran & Lertwongsatein, 2005) when integration of information technology capabilities and business intelligence enable to create information technology flexibility and information that not easily be imitated by the competitors.

Malaysia is one of an information technology hub in the Asia region (Internet World Stats, 2014). A survey implies Malaysia information technology spending is expected to reach US\$5.6 billion in 2013, up 7% compare to the year of 2012 (Market Research, 2013). In 2012, government of Malaysia announced to invest and develop Digital Malaysia Master Plan for Malaysia's ICT sector (Market Research, 2013). The master plan can stimulate organizations to focus ICT development for expanding the business. It has proved that information technology plays a role in the business environment to enhance organizational performance. Today, business and IT is becoming more prevalent in organizations for decision making management. According to Gartner Research (2013), it is expected business intelligence software sales increase 9% from 2012 and hit RM114.5 million (US\$37 million) in 2013. In Malaysia, 51% of organizations are invested in IT for making a better decision. These results indicate that many organizations are viewed the use of IT to gain competitive advantages of agility, flexibility and quick to the changing environment (Ong, & Siew, 2013).

In addition, the wake of the collapse of corporate Enron, Worldcom, EBS International and Xerox have brought about renewed scrutiny into corporate governance mechanisms and the effectiveness of these mechanisms. Poor corporate governance, misconduct practice in accounting, poor implementation of Enterprise Resource Management (ERM) has also involved some of Public Listed Companies (PLCs) in Malaysia have weaken the confidence level among the investors on financial report, as well as internal control and system monitoring of these companies. Academic research like Beasley & Frigo (2007), Klein (2002) and Carcello & Neal (2000) has showed recent business failures are very much related to senior management making poor decision, risk mismanagement, governance and poor financial reporting quality, fraudulent financial statement, earning manipulation and poor internal control. Corporate scandal that happens in Malaysia today is not unique. There are some failure companies in Malaysia where ITG and corporate governance is not effective like Perwaja Steel Sdn Bhd, Transmile, Malaysia Airlines System (MAS), and Port Klang Free Zone (PKFZ). This showed organization in Malaysia still lack of ethics in compliance has adversely impacted the company's existence. Effective ITG is highly needed in organization business to ensure project success, business value delivered and corporate goal achieved. Weill and Ross (2004) mentioned that effective ITG is to design a set of ITG mechanisms that aligned behaviors and decision making with organization especially in the mission, culture and strategy. A good organization with effective ITG will help to foster project success and promote business value. For instance, Weill and Ross (2004) showed at least a 20 percent better return on IT investment when effective IT governance is in place.

Malaysia has realised the importance of ITG in organization which is also strongly driven by the implementation of corporate governance. Given the occurrence of information technology (IT) in many organizations, the examination of corporate governance mechanisms also includes ITG mechanisms. Many organisations started with the implementation of IT governance to achieve a better alignment between business and IT (De Haes, S., & Van Grembergen, W., 2009). Lunardi, G. L., Maçada, A. C. G., & Becker, J. L. (2014) explained the primary objective for ITG are to assure that it helps to improve the business value in the organization, monitoring the management performance and finally to mitigate or manage the operation risk by using information technology. Information technology is the ability of organization to combine information technology resources to respond to the complexity business environment in order to improve organizational performance. Effective ITG has become very crucial and important for corporate company to do their business. We can notice that organization in Malaysia has invested lot of money in IT and governance awareness has become heavier in our PLCs in preventing corporate scandals, rapid changes in business environment. Effectiveness of ITG in an organization is crucial for any organization to achieve its corporate goals by maximization of IT benefits. ITG has become common practices in companies as day-to-day operations to strategically drive and control IT in order creates and achieves business value.

IT Governance has varying definitions. IT governance is the authority and decision making structure of organization leaders & managers to optimize & control the use of IT resources from planning, implementation & monitoring/evaluation to reach organization's objective, by using certain mechanisms. Good IT governance ensures that

IT is delivering the desired value for the organization while minimizing the inherent risk of IT (Wibowo, A. M., & Yuwono, B., 2008). Identifying the decision rights and accountability framework to support desirable outcome with IT adoption (Weill and Ross, 2004). (IT Governance Institute, 2007) defines ITG with the integrated of leadership, organizational structures and processes with the desirable outcome that the corporate goal is achieved. The Australian Standard for Corporate Governance of ICT, describe Corporate Governance of Information and Communication Technology (ICT) as the mechanism that manage the present and future use of ICT where it involves assessing and executing the strategies adopting ICT in order to achieve goals. To simplify the broader and narrower definition of IT Governance, the decision rights and the effective use and management of IT resources is a critical component in achieving corporate goals and objectives.

With the growing importance of IT Governance effectiveness, there are rising needs of number of supporting mechanisms of effective IT resources management. Information Technology Governance Institute (ITGI) responsible for The Control Objectives for Information and related Technology (COBIT) is an approach to regulate effective IT security and control practices by providing resources and tools to measure the performance of IT processes of an organization (IT Governance Institute, 2007). ISO/IEC 38500:2008 (Corporate governance of information technology) offers guidelines or standards for senior management to use IT for enhancement of effective, efficient governance and to comply with legal, regulatory, and ethical in an organization.

Essentially, Information Technology Governance (ITG) falls under the category of Information Technology (IT). Therefore, ITG effectiveness is considered as a type of

Information Systems (IS). In that case, if one wants to study the ITG adoption in organization, then one has to look at the available IT adoption models at organization level. Likewise, this is a research about ITG adoption in organization, so it is important for us to look around the IT adoption models available for reference. Borgman, H. P., Bahli, B., Heier, H., & Schewski, F., (2013) has applied Technology- Organization-Environment (TOE) framework in the research to investigate cloud computing adoption and IT governance. Oliveira and Martins (2011) indicated that there are not many choices for IT adoption models especially from organization perspective. Other researchers studied on the success and failure of IT Governance framework adoption by using the TOE framework (Aoun, C., Vatanasakdakul, S., & Chen, Y., 2011). Among others, the two prominent models that are referred most of the times are Diffusion On Innovation (DOI) theory, and Technology- Organization-Environment (TOE) framework. Nonetheless, because TOE framework includes the environment context, so it is seemed able to elaborate the innovation adoption in better details and more thorough compared to DOI (Oliveira & Martins, 2011). Not just that, TOE is also come with solid theoretical basis, and consistent empirical support. There are three aspects in TOE framework namely technology, organization and environment context which determine the process of adopting, implementing and utilizing in a firm (B. Pudjianto, Zo, Ciganek, & Rho, 2011). Technological context describes both the internal and external technologies relevant to the organization where they include current process and infrastructure available to the organization. At the same time, organizational context refers to descriptive measures, organizational characteristics and resources possessed by the firm.

Lastly, the environmental context consists of the environmental characteristics and resources in which the firm conducts their business activities.

Organizational performance has been identified as the most important criterion in evaluating results of the organization's operation. This performance determines long term sustainable of the organization in a competitive environment. With high level of the performance perceived the effectiveness of the activities managed by the organizations. Thus, it can be viewed as performance measurement is important to evaluating an organization due to the evaluation is one of the main management agendas to improve organizational performance (Ebrahimpour, Salarifar & Asiaei, 2012).

1.2 Problem Statement

Information Technology (IT) is crucial to the support, sustainability and growth of the organization business (Law, C. C., & Ngai, E. W., 2005; Qureshil, S., Kamal, M., & Wolcott, P., 2009). IT also creates the potential to maintain existing business strategies, but also to create new strategies (Van Grembergen, 2004; Henderson, J. C., & Venkatraman, N, 1993). Critical dependency on IT has created exclusive focus on IT Governance effectiveness due to heavy use of technology in business organizations.

A survey implies Malaysia information technology spending is expected to reach US\$5.6 billion in 2013, up 7% compare to the year of 2012 (Market Research, 2013). Whereas, worldwide IT spending is projected to total \$3.8 trillion in 2014, a 3.1 percent increase from 2013 spending of \$3.7 trillion, according to the latest forecast by Gartner (2014). In 2013, the market experienced flat growth, growing 0.4 percent year over year.

The survey showed that companies are invested huge amount into IT as they want IT to deliver desired value and to achieve company objectives.

IT governance is to authorize managers to optimize & control the use of IT resources to reach organization's objective. Good IT governance ensures that IT is delivering the desired value for the organization while minimizing the inherent risk of IT. To summarize IT Governance role, the decision rights and the effective use and management of IT resources is a critical component (Wibowo, A. M., & Yuwono, B., 2008; Weill and Ross, 2004).

With the existence of corporate governance, IT Governance effectiveness becomes key and fundamental part of successful adoption of corporate governance overall. Effectiveness of ITG in an organization increases the business processes the mechanism of IT processes, IT resources, and information to the company's strategic direction and objectives. ITG has become common practices in companies as day-to-day operations to strategically drive and control IT in order creates and achieves business value. Besides, ITG effectiveness formulate and formalize best practice from planning, management, implementation and support, and monitoring IT performance, to ensure company information and other related technologies becomes advocates for the achievement of corporate goals.

A series of corporate scandals like Enron, Worldcom, EBS International and Opes Prime have brought attention into corporate governance mechanisms and the effectiveness of these mechanisms. A survey study from The Standish Group (2006) has reported that about 67% of IT projects failed or were challenged to justify the investment. IT plays important role in improving corporate governance practices because crucial

business processes are mainly automated and directors need to make decision based on the information generated by IT systems. The growth relationships between organization and their customers and suppliers have focused on how to utilize IT to create value into business strategies, effectiveness in managing IT resources and minimize IT failure. Due to corporate scandals that showed lack of ethics in compliance has forced government in Indonesia to enact laws such as Sarbanex-Oxley Act (2002) in US (Wulandari, P. R., Lee, S. D., & Nur'Ainy, R. R., 2012).

Ineffective ITG in a company will lead to poor performance of a company because failure alignment of IT execution with business strategies and objectives, project failure, unjustified cost of investment, traceability and accountability issue, project overages, lack of visibility into IT infrastructure and processes and weak internal control (Bowen et al, 2007 and James Roger, 2014) As corporations invest highly in and rely heavily on IT, they expose themselves to high risks. Nevertheless, Pereira and Mira da Silva (2012) described effective ITG in a company is essential. Effective ITG can contribute to higher returns on assets at a time when businesses are increasing their technology investment (Webb et al., 2006; Sactang, S., & Haider, A. 2012).

The literature consistently highlighted the importance of ITG within organizations by promoting the benefits that ITG claims to deliver to organizations them. Many organizations have implemented their individual ITG frameworks in the hope of enjoying the advantages. Evidently, these implementations come at a high cost, the needs of the study to be carried out is important to prove the significant of the relationship between determinants and ITG effectiveness. There is lack of study on the determinants of ITG effectiveness that using TOE framework model namely technology, organization and

environment context as well as the outcome of ITG effectiveness. Therefore, this study is undertaken to fill-in the gaps by investigating the determinants and outcome of ITG effectiveness.

One might begin to consider the validity of the statement made by Koch (2002) that ITG is often more theoretical than practical. There are positive relationships between ITG and organization performance was done in the studies done by researcher (Buckby, S., Best, P. J., & Stewart, J. D., 2005). Teo et al. (2009) acknowledged that there are researchers debating whether technology implementation able to improve firm value or performances. However there are contradictory findings from the previous studies on the impact of ITG on organizational performance. In fact, there are little evidence to confirm the relationship between effective ITG and organization performance.

Thus, this study is timely in providing the much needed empirical support on the issues mentioned above. This study attempts to examine the relationships between determinants of ITG effectiveness and its outcome to Organizational Performance of Public Listed Companies (PLCs) in Malaysia. The organization performance is examined by looking at the quantitative (financial) and qualitative (non-financial) measurements. Besides, this study also examines the type of industries as a variable that moderates the relationship between ITG effectiveness and organizational performance.

1.3 Research Objectives

a) To investigate the relationship between technology capability and IT Governance effectiveness.

- b) To investigate the relationship between top management support and IT Governance effectiveness.
- c) To investigate the relationship between environmental volatility and IT Governance effectiveness.
- d) To investigate the relationship between IT Governance effectiveness and organizational performance.
- e) To investigate the moderating effect of industry type on IT Governance effectiveness to organizational performance.

1.4 Research Questions

To achieve the above objectives, the research questions in this study are as follows.

- a) What is the relationship between technology capability and IT Governance effectiveness?
- b) What is the relationship between top management support and IT Governance effectiveness?
- c) What is the relationship between environmental volatility and IT Governance effectiveness?
- d) What is the relationship between IT Governance effectiveness and organizational performance?
- e) Does industry type moderate the relationship between IT Governance effectiveness and firm performance?

1.5 Significance of the Study

Organizations have spent countless of time and amount of money to pursue their strategy by implementing ITG in their organization. The study of the determinants and impact of effectiveness on ITG has become crucial in PLC Malaysia on sustaining and further increasing the organizational performance.

This study has both theoretical and practical significance. Theory of resource based view and Technological-Organizational-Environmental (TOE) framework is applied to develop the theoretical framework. For researchers, this empirical research develops a framework that clarifies contribution of the determinants influencing ITG and its outcomes to organisational performance. It examines the relationships in depth, to validate and to test the framework. The outcome from the validation will allow ITG to play more significant role and knowledge in an organizations. In addition, this study attempts to investigate Industry Type as the moderator between IT Governance effectiveness and Organizational Performance. The data collected from this study is analysed using Structural Equation Modeling (SEM) and Partial Least Square (PLS).

For practitioners such as CEOs, COOs, CTOs, CIOs, and IT Managers in IT department, the outcome from this study can provide useful insights on the determinants of the ITG effectiveness. Using balanced scorecard of four perspectives, they will gain better understanding on the effectiveness of ITG and impact of organizational performance. For practical significance, this will help benefit the existing ITG and enhance effectiveness in the organization with appropriate action.

With the increasing rate of professional misconduct such as frauds in Malaysia has been in an alarming rate with cases of “ Mini Enrons” like Sunshine Empire, Megan Media , Transmile and so on, the role of IT governance in addressing fraud issues has been vital. Hence this study will bring benefits to the practitioners to provide a more complete understanding of the current issues in IT governance. This research will bring contribution to the practical world in finding factors that contribute to better governance, and the outcome from IT governance effectiveness.

1.6 Definition of Key Terms

In order to have a mutual understanding about the terms used in this study, the following key terms defined and referred throughout this study accordingly:

1.6.1 IT Governance

Information Technology (IT) Governance refers to the processes that ensure the effective and efficient use of IT in enabling an organization to achieve its goals (Gartner, 2013). ISACA (2010) has defined IT governance as the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives.

1.6.2 Technology Capability

Technology capability refers to the level of readiness pertaining to technological competency and infrastructure available to the organization. That includes software, hardware, human capital and data collection/integration such as operating system at client and server level, network connectivity, storage devices for database, user knowledge and data input flow (B. Pudjianto, et al., 2011; Schniederjans & Yadav, 2012).

1.6.3 Top Management Support

The top management support is the source and force for organization resources as well as culture cultivation. Thus, support and commitment from decision makers are always crucial to the success of technology innovation development and adoption (Teo, Lin, & Lai, 2009). Besides, the leadership commitment is also the driver to ensure the change in business process which is paramount to development and implementation process (Koh, Gunasekaran, & Goodman, 2011).

1.6.4 Environmental Volatility

Environmental volatility refers to the level of instability or unpredictability faced by an organization from unexpected changes of organization's environment (Dess & Beard 1984; El Sawy & Pavlou, 2008). It is also can be explained by the randomly events and unpredictable variation that can impact the current business (Vivek & Ravindran, 2007).

1.6.5 Organizational Performance

Refer to the Olson, Slater and Hult, (2005), organizational performance defines how efficient and effective of organizations manage business strategies that finally causes synergy. This supported by Pebrianto, Suhadak, Kertahadi, and Djamhur (2013) who explain organizational performance is an indicator to measures how well an organization achieves the goals which can be evaluated by the organization's efficiency and the achievement of mission, activities and objectives influence.

1.6.6 Industry Type

In this research, type of industry refers in term of manufacturing and service sector (Lee, G., & Xia, W., 2006; Department Of Statistic, Malaysia., 2014; MITI, 2013; Mohd Ghazali, N. A. & Weetman, P., 2006). It is a vital variable to indicate the moderating effect on organizational performance after technology adoption. Previous study found that organizational performance happens unevenly across country with different environment after implementation of innovation (B. Pudjianto, et al., 2011; Sánchez-Ballesta & García-Meca, 2007). Likewise, different type of management style in different organization type will affect the level of company performance.

1.7 Organization of Remaining Chapters

This report is organized into 5 chapters as below:

Chapter 1: introduces the background of study, identifies the research problems and objectives. Lastly, the chapter is ended with discussion on the significance of study.

Chapter 2: reviews of the related literatures of theories for study and main variables in the research.

Chapter 3: concentrates on the research framework, design of study and methodological procedures.

Chapter 4: reports and elaborates the results based on the data analysis and the tested research hypotheses.

Chapter 5: concludes the study with discussions, implications and limitations of research.

CHAPTER 2

2.0 Literature Review

Majority of the previous studies on ITG use what is known as the resource based view theory (Barney, 1991) to study the competitive advantages on the organization. Based on a review of literature, we have identified 3 factors that serve as determinants of IT governance: Environment factors, Organizational factors and Technological factors. Tornatzky and Fleischer (1990) developed Technology-Organization-Environment (TOE) to study technological innovation adoption by the organization. This chapter is to discuss the specific theories relating to the effectiveness of the IT governance and public listed companies' performance in Malaysia. This chapter shows the theoretical framework and hypotheses that look for the answer the research questions that stated in chapter 1.

2.1 Resource Based View Theory (RBV)

In a paper published by Wernerfelt (1984), it is proposed that resources of organization are as important as the products and services. In the same paper, Wernerfelt (1984) further exemplified some forms of resources such as technological and financial which when they are utilized correctly, it can help firm to increase performance. In other words, firm resources will influence company performance whereby a firm with more resources has better chance to achieve more competitive advantages. The view of resource-based was further supported by a study which suggested heterogeneity, imperfect mobility, ex ante limits to competition and ex post limits to competition are four cornerstones to firm's competitive advantage (Peteraf, 1993).

By the way, although generally the Resource Based View (RBV) suggests that firm performance is affected by its competitive advantages which determined by the utilization of valuable, rare resources and capabilities, an empirical research found that competitive advantage mediates the rareness and valuable resources to performance relationship (Newbert, 2008). Nevertheless, the successfulness of RBV in a company does not come naturally or automatically even the firm owns rare and valuable resources. There are few other internal factors which contributing to the achievement of RBV(Lockett, Thompson, & Morgenstern, 2009).

As mentioned in previous paragraph, resources from technological perspective were proven one of the prevailing sources helping to increase firm performance. For instance, from a meta analysis carried out few years ago, the authors have discovered that technological resources would lift up internal and external abilities of a firm, which in turn influence the performance (T.-P. Liang, You, & Liu, 2010). Furthermore in a more recent paper, some researchers in fact advocated that technology resources should be presumed as digital business strategy where it could offer direction for the next generation of insights (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013). That school of thought is consistent with one of the investigations proposed in this study where IT system may assist to impact company performance.

2.2 Technology-Organization-Environment (TOE) Theory

Tornatzky and Fleischer (1990) developed Technology-Organization-Environment (TOE) to serves a vital framework for anticipate the studies of technological

innovation adoption. As a result, the framework identifies 3 categories of factors, which have superior influence on the adoption of innovations by organizations, which are technological factors, organizational factors and environmental factors. The technological factors consider the availability technologies important to the firm in enhancing the organization productivity. The organizational factors refer to the characteristic of the firms, which includes the size, and age of the organization. The environment dimension are included the hostility, dynamism and heterogeneity (Aldrich, 1979; Dess and Beard, 1984; Miller and Friesen, 1983; Hall, 1999)

2.3 IT Governance Effectiveness

IT governance is cited as a strategic issue that requires commitment at a strategic level. According to Simonsson and Johnson (2006), IT governance relates to IT decision-making authority, organization capabilities, structures, processes, and relational mechanisms that result in an alignment between business and IT. Based on a literature review, there is no consensus on a standard definition of IT governance; the literature does suggest various perspectives of IT governance (Table 2.1).

Category of perspectives	Perspective	Sources
Governance Mechanisms	Governing structure and process	Peterson (2000)
	Governing structure, leadership and process	ITGI (2003)
	Governing principles and decision rights on IT investments, IT architecture, IT infrastructure, and applications	Smaltz et al. (2007)

	IT structure, processes, and relational mechanisms	DeHaes and Van Grembergen (2004, 2005, 2006, 2008a, b, 2009, 2010), Van Grembergen et al. (2004) and Grant et al. (2007)
Decision-making	How IT decisions are made and who are responsible in the decisions	Xue et al. (2008)
	Decision-making rights and accountability on IT principles, IT architecture, IT infrastructure strategies, business application needs, IT investment, and prioritization	Weill and Woodham (2002) and Weill and Ross (2004)
	IT decision-making authority, organizational capabilities, structure, process, and relational mechanisms that result in the alignment between business and IT	Simonsson and Johnson (2006)
	Organizational capabilities, decision-making authority, and security	Itakura (2007)
	Authority for IT decisions, processes IT and business managers use at strategic, tactical, and operational levels to set IT priorities and allocate IT resources	Luftman et al. (2008)
	Stakeholder involvement in IT decision-making, motivation, and constraint mechanism to resolve information problem and maximize IT revenue	Tu and Zhang (2008)
Strategic alignment of business and IT	Activities and structure to align business and IT, targets for IT, principles to organize IT activities, resource usage, risk management, governance structures, and performance measurement	Dahlberg and Kivijarvi (2006)
	Relationship between business and IT	Ward and Peppard (1996)
	Strategic alignment, delivery of business value through IT, performance management, risk management, policies and procedures, and control and accountability	Webb et al. (2006)
Strategic IT planning and control	Strategic and environmental imperatives, structure, and IT design	Schwartz and Hirschheim (2003)
	Process to direct and control IT	Gallegos (2003)
	Evaluation, directing, and monitoring of plans for the use of IT	Rosemeijer (2007)

Table 2.1 : Perspectives of IT Governance and sources

Based on these perspectives, ITG spans involvement of personnel at various levels of an enterprise (i.e. from strategic to operational levels). Each level of the organizational hierarchy and IT function has different ITG needs. Hence, ITG encapsulates governing structure, leadership, processes, and relational mechanisms to address performance while providing assurances that information are protected from IT-related risks.

Supporting ITG implementation and monitoring performance, various associations and regulatory bodies introduced ITG frameworks. Each framework addresses specific objectives including IT control structure, protection of IT investment, security and control of IT, protection of information from losses, assuring information integrity, quality IT services, and quality software (Table 2.2). More recently, the literature suggests that ITG dimensions include structure, process, and relational mechanisms (DeHaes and Van Grembergen, 2004, 2005, 2006, 2008a, b, 2009, 2010; Grant et al., 2007).

Category of IT governance framework	IT governance framework	Description
IT service delivery	Control of Business Objectives and Technology (COBIT)	Provides clear policies and good practices for management, security, assurance and control of IT in organizations. COBIT is a process model that subdivides IT into 34 high level control objectives and 318 detailed control objectives in line with the responsibility to plan, build, run, provide, and monitor IT
	Information Technology Infrastructure Library (ITIL)	Provides clear guidelines for IT service provider organizations to improve IT efficiency and effectiveness and quality of IT services within imposed cost constraint
	Capability Maturity	Accepted as the de facto standard for

	Model (CMM/ CMMI)	development and enhancement of software development processes
Information security	ISO 27001	Provides a formal set of specifications for organizations to manage information security risks and seek certification for their Information Security Management System (ISMS)
Business standards	The Committee of Sponsoring Organizations of the Treadway Commission (COSO)	Focuses on operational, compliance and financial control objectives for management and auditors in dealing with risks to internal control
	Statement on Auditing Standards No. 70 (SAS70)	Defines control objectives and activities that should be organized in a manner that allows the user, auditor, and user organization to identify
Project management	Project Management Body of Knowledge (PMBOK)	A set of best practices that consist of processes to manage any projects including IT project
	Projects IN a Controlled Environment (Prince2)	Process-based approach to manage any projects including IT project
General	Six Sigma	Relates to improvements in capability and reduction in defects. In an IT environment, Six Sigma could be tailored to performance improvements in network speed and system reliability

Table 2.2: IT Governance Framework

Structure consists of organizational units, roles, and responsibilities for making IT decisions between management and IT committee cooperation (Weill and Ross, 2004). The governance structure details how many committee levels or layers there are and outlines each of their primary roles (Grant et al., 2007). Structure describes the way IT function is organized and the organizational structure of the IT division in the organisation (Rau, 2004).

Process refers to strategic decision-making, SISP, and monitoring key performance indicators including service level agreements, IT demand management, IT portfolio management, and chargeback systems (Symons, 2005). Besides IT balanced